

Downtown Tempe Shared Parking Assessment (DRAFT)

January 2007

Prepared for:

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1. Introduction

1.01. Study Purpose and Approach

The Downtown Tempe Community (DTC) commissioned *Carl Walker* to conduct a review of shared parking in downtown Tempe. The analysis of shared parking involved a comprehensive review of existing parking conditions (e.g., parking inventory, parking occupancy) on a block-by-block and quadrant basis. Using the review of existing conditions as a baseline, *Carl Walker* estimated future parking conditions (e.g., future parking supplies, demand) on the same block-by-block and quadrant basis. The primary purposes of this parking study was to provide a review of current parking inventory, utilization, and demand counts, as well as provide recommendations for possible future parking supplies and management strategies based on shared parking concepts.

1.02. Scope of Services

The scope of services for this project consisted of four primary tasks. The final scope of services is summarized as follows:

Task 1 – Review of Background Data and Definition of Parking Issues

- Submit an initial “request for information” (RFI) to become familiar with area issues, existing facilities and other characteristics.
- Review any pertinent studies/reports provided by the DTC concerning the study area, including any previous parking inventories, parking demand studies, traffic flow analyses and proposals for any new parking facilities made during previous planning efforts.

- While reviewing background materials, identify major issues impacting parking and identify information that will need to be updated.

Task 2 – Review Parking Occupancy and Turnover Surveys

- Meet with representatives of the DTC to identify existing conditions and confirm/document the existing parking inventory.
- Review and evaluate development plans and other parking demand variables. This will include identification of potential new sources of parking demand and supply that may impact parking operations.
- Identify and review available statistical data on land uses and parking utilization.
- Review the inventory of existing parking in the study area (per a survey to be completed by the DTC). Parking will be categorized based on location and the type of parking provided (on-street vs. off-street).
- Determine the existing peak parking occupancy period(s). Parking occupancy counts will be completed by DTC staff during a typical week. Determine parking surpluses and deficits by block and quadrant/zone.
- As parking demand can vary throughout the year, parking occupancy counts will be adjusted to better reflect typical parking conditions (if necessary). *Carl Walker* will work with DTC staff to determine appropriate adjustment factors and strategies.

Task 3 – Alternatives Analysis

- Based on the initial review of current parking conditions in the study area, conduct an analysis of downtown parking supply and demand issues. The analysis will provide options to meet projected future parking needs.
- Determine future parking demand by reviewing anticipated future development plans and estimated parking demands. Determine future parking surpluses or deficits on a block and quadrant/zone basis within the study area.
- Develop options for addressing current and projected parking demands, based on observed and projected parking occupancy.
- Review the City's existing off-street parking requirements/ordinances and shared parking model, and provide recommendations for improving/updating them.
- Develop short-term and long-term recommended parking system improvements and recommend an improvement implementation program.

Task 4 – Completion of Final Report

- Provide a copy of the draft report to the DTC for final review, and incorporate any final comments and complete the final report.
- Present the final report to the DTC, Parking Committee and designated stakeholders.

1.03. Study Area

The study area is roughly bounded by the Rio Salado River to the north, University Drive to the south, College Avenue to the east and Farmer Avenue to the west. The following graphic illustrates the study area (study area outlined in turquoise).

Figure 1. Study Area



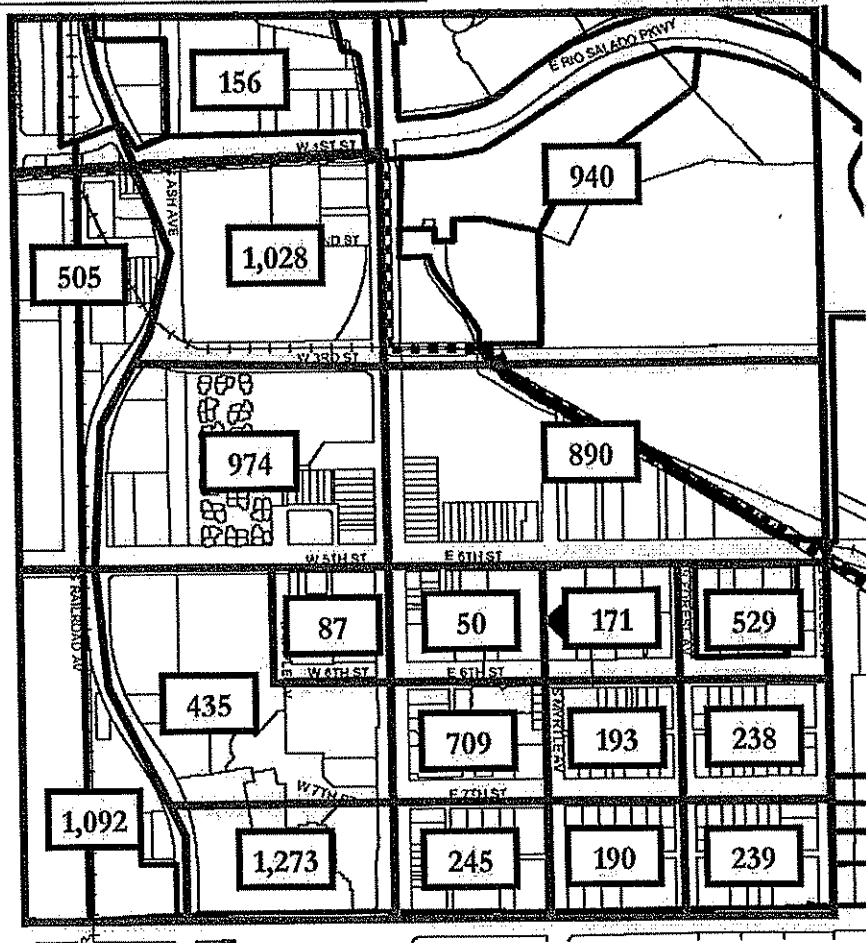
2. Current Parking Supply and Demand

2.01. Current Parking Supply

The Downtown Tempe Community (DTC) conducted parking inventory and occupancy counts starting on Tuesday April 4, 2006 and ending on Saturday April 8, 2006. The parking spaces were classified into two primary categories, on-street and off-street. On-street spaces refer to spaces located on a roadway, adjacent to a block. Off-street spaces refer to spaces located within a block. Generally, all on-street spaces were available for public parking while the majority of off-street spaces were reserved for a particular group (e.g., specific customers, reserved parking). In this report, public parking will primarily refer to DTC managed parking available to all user groups. Private parking will refer to parking owned privately and designated for a specific business or user group.

The downtown Tempe study area currently has a total parking supply of 9,944 parking spaces. Of these, 9,438 parking spaces (95%) are in off-street parking lots and 506 spaces (5%) are located on-street. The following graphic illustrates the total parking supply located at each block as of April 2006 (off-street plus on-street).

Figure 2. Total Parking Inventory by Block



The following two subsections summarize the current downtown parking supply by type (off-street versus on-street).

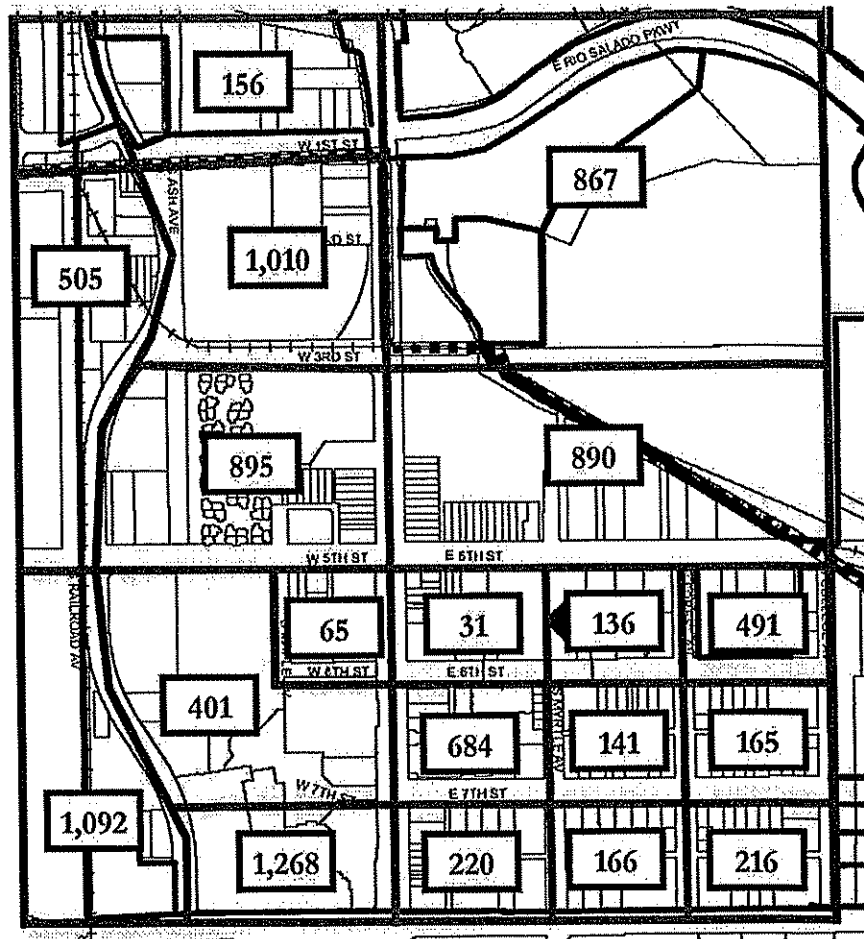
2.01.1. Off-Street Parking Supply

The study area contained an approximate total of 9,438 off-street parking spaces. There are currently approximately 2,974 public off-street parking spaces, with the remaining 6,464 parking spaces reserved for specific user groups. Based on current parking space inventories, the DTC currently manages approximately 30.7% of the

total off-street parking supply. The DTC managed off-street facilities are either owned by the City of Tempe or a private entity, and parking is provided at a charge. Some DTC parking facilities utilize multi-space parking meters, while others use exit-cashiering technology and charge hourly parking fees.

The following graphic illustrates the off-street parking supply in each block.

Figure 3. Off-Street Parking Inventory

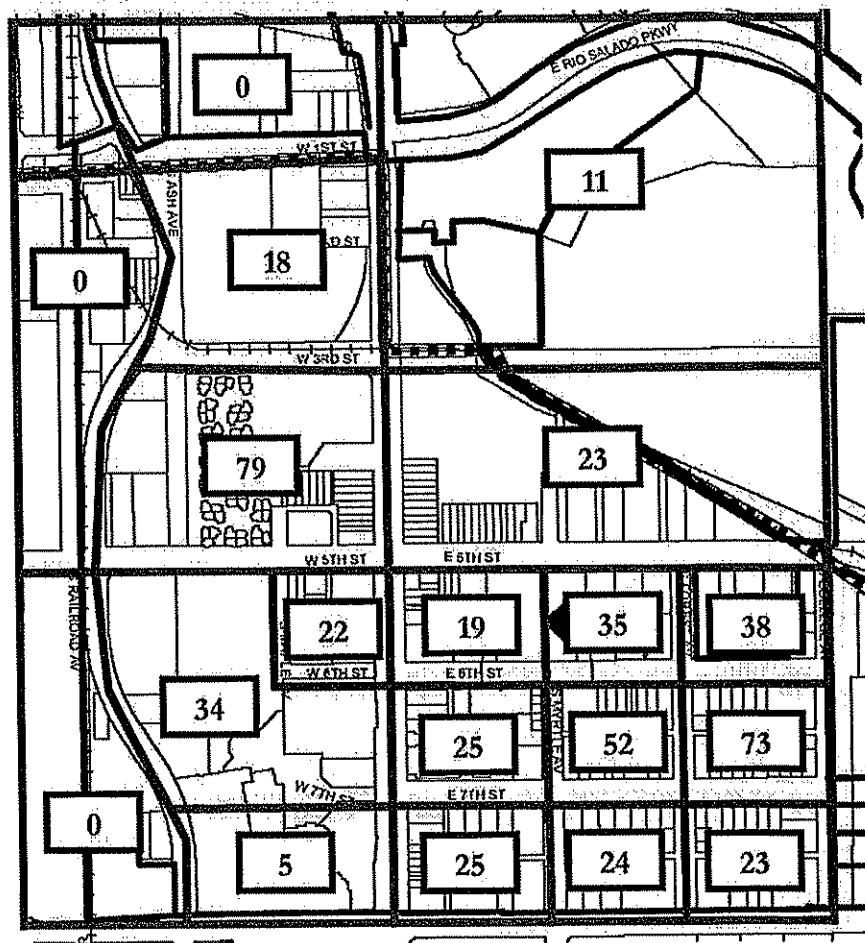


2.01.2 On-Street Parking Supply

The study area contains approximately 506 public on-street spaces, all of which are controlled by the city. The on-street parking is available to the public on a first-come-first-serve basis, and single-space electronic parking meters are used to collect parking fees and encourage vehicle turnover.

The following graphic illustrates the on-street parking supply located on each block (sum of all on-street parking on each block face).

Figure 4. On-Street Parking Inventory



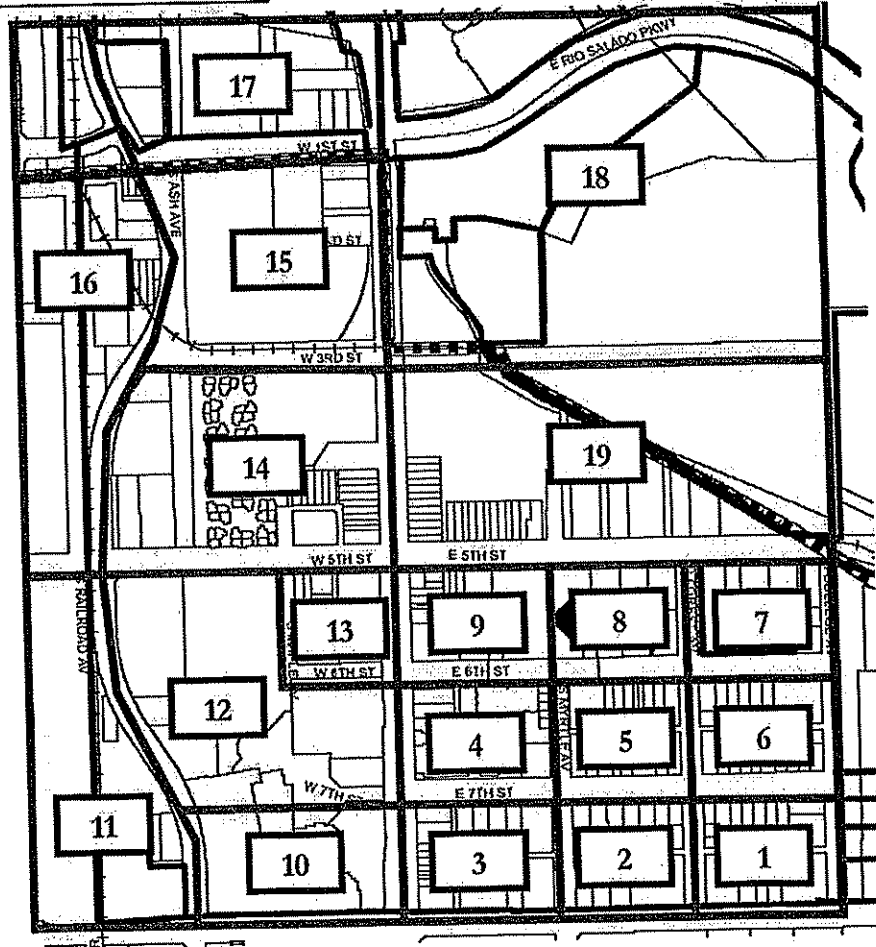
2.02. Current Parking Demand

The Downtown Tempe Community conducted occupancy surveys to determine how many parking spaces were utilized during a typical peak parking period. The completed surveys provided “snapshots” of parking occupancy, and did not attempt to determine the absolute peak parking period. The parking occupancy surveys were conducted every two hours between 8:00 a.m. and 6:00 p.m. on Tuesday, April 4 and Friday, April 7, and between 6:00 p.m. and 12:00 a.m. on Thursday, April 6 and Saturday, April 8. The results from each of the parking survey periods were grouped into Tuesday/Thursday and Friday/Saturday counts.

The parking occupancy surveys looked at two categories of parking; on-street and off-street. The occupancy surveys did differentiate between general public and private off-street parking spaces. However, as most of the private parking spaces provided both employee parking and customer parking, dividing the user types for this limited occupancy survey would have been impractical. The intent of the surveys was to determine the overall level of parking utilization in the study area, and the results will serve as a baseline for determining future parking expansion needs and management options.

Prior to conducting the parking inventory and occupancy surveys, block numbers were assigned to the various blocks located in the study area. The block numbers shown in Figure 5 will identify each block throughout this study. The following graphic illustrates the block numbering sequence.

Figure 5. Block Numbering



Some parking areas were not included in the parking occupancy counts. A total of 953 parking spaces were not included in the parking occupancy surveys. The following parking areas were not included in the parking surveys:

- Block 3 – Shop of Art Lot (8 spaces)
- Block 8 – Bandersnatch Lot (16 spaces)
- Blocks 12 and 13 – Maple Street On-street Parking (18 spaces)
- Block 17 – Tempe Beach Parking Lot and the Penny Saver Parking Lot (156 spaces)
- Block 18 – Hayden Ferry Lakeside Parking Structure (755 spaces).

A total of 8,991 parking spaces were included in the parking occupancy surveys (90.4% of the total parking supply). Of the surveyed supply, 3,356 spaces were available to the general public (regardless of destination) and 5,635 spaces were private (available to only specific user groups). The 3,356 public parking spaces included 2,868 off-street and 488 on-street spaces. The surveyed lots included the Armory Parking Lot located adjacent to Block 7.

The overall peak period of parking occupancy occurred at 12:00 p.m. on Tuesday, April 4, 2006. During this period, a total of 6,384 parking spaces were occupied during the survey period. This level of usage translates into 71.0% of the surveyed parking supply. The following tables illustrate the total observed occupancy levels for all blocks in the study area during the peak parking periods (detailed results for all days can be found in Appendix A):

Table 1. Overall Occupancy Results – Tuesday/Thursday

Parking Occupancy Results - Tuesday/Thursday Occupancy Count (Total On-street and Off-street)

Block #	# of Spaces	Observed Parking Occupancy								
		8:00 AM	10:00 AM	12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM	12:00 AM
1*	239	74	166	203	185	163	106	97	48	34
2	190	18	44	96	97	57	40	62	33	22
3	237	58	129	177	160	156	104	107	96	75
4	709	329	569	605	571	525	473	529	413	198
5	193	74	134	163	135	90	79	95	70	60
6	238	62	195	168	173	148	183	131	65	33
7	529	334	379	385	378	362	360	248	239	234
8	155	101	111	115	119	101	107	139	106	99
9	50	25	38	41	43	37	45	57	55	50
10	1,273	786	930	1,094	1,044	795	570	390	299	209
11	1,092	431	533	564	545	449	174	101	47	38
12	426	63	234	345	322	274	282	234	144	123
13	78	21	39	60	47	39	47	52	48	46
14	974	438	601	776	753	647	669	636	787	738
15	1,028	517	610	692	732	587	273	171	158	120
16	505	147	204	260	209	170	159	111	146	137
17	0	Not Counted								
18^	185	160	173	174	163	64	62	69	47	43
19	890	458	456	466	421	309	369	303	236	202
TOTAL	8,991	4,096	5,545	6,384	6,097	4,973	4,102	3,532	3,037	2,461

Notes:

* = Block 1 does not include the ASU Foundation Parking Structure (outside of the study area and restricted to specific users).

^= Lakeside parking structure not included in the parking occupancy counts.

Table 2. Percentage of Occupied Parking – Tuesday/Thursday

		Percentage of Parking Occupied								
Block #	# of Spaces	8:00 AM	10:00 AM	12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM	12:00 AM
1*	239	31.0%	69.5%	84.9%	77.4%	68.2%	44.4%	40.6%	20.1%	14.2%
2	190	9.5%	23.2%	50.5%	51.1%	30.0%	21.1%	32.6%	17.4%	11.6%
3	237	24.5%	54.4%	74.7%	67.5%	65.8%	43.9%	45.1%	40.5%	31.6%
4	709	46.4%	80.3%	85.3%	80.5%	74.0%	66.7%	74.6%	58.3%	27.9%
5	193	38.3%	69.4%	84.5%	69.9%	46.6%	40.9%	49.2%	36.3%	31.1%
6	238	26.1%	81.9%	70.6%	72.7%	62.2%	76.9%	55.0%	27.3%	13.9%
7	529	63.1%	71.6%	72.8%	71.5%	68.4%	68.1%	46.9%	45.2%	44.2%
8	155	65.2%	71.6%	74.2%	76.8%	65.2%	69.0%	89.7%	68.4%	63.9%
9	50	50.0%	76.0%	82.0%	86.0%	74.0%	90.0%	114.0%	110.0%	100.0%
10	1,273	61.7%	73.1%	85.9%	82.0%	62.5%	44.8%	30.6%	23.5%	16.4%
11	1,092	39.5%	48.8%	51.6%	49.9%	41.1%	15.9%	9.2%	4.3%	3.5%
12	426	14.8%	54.9%	81.0%	75.6%	64.3%	66.2%	54.9%	33.8%	28.9%
13	78	26.9%	50.0%	76.9%	60.3%	50.0%	60.3%	66.7%	61.5%	59.0%
14	974	45.0%	61.7%	79.7%	77.3%	66.4%	68.7%	65.3%	80.8%	75.8%
15	1,028	50.3%	59.3%	67.3%	71.2%	57.1%	26.6%	16.6%	15.4%	11.7%
16	505	29.1%	40.4%	51.5%	41.4%	33.7%	31.5%	22.0%	28.9%	27.1%
17	0	Not Counted								
18^	185	86.5%	93.5%	94.1%	88.1%	34.6%	33.5%	37.3%	25.4%	23.2%
19	890	51.5%	51.2%	52.4%	47.3%	34.7%	41.5%	34.0%	26.5%	22.7%
TOTAL	8,991	45.6%	61.7%	71.0%	67.8%	55.3%	45.6%	39.3%	33.8%	27.4%

Notes:

* = Block 1 does not include the ASU Foundation Parking Structure (outside of the study area and restricted to specific users).

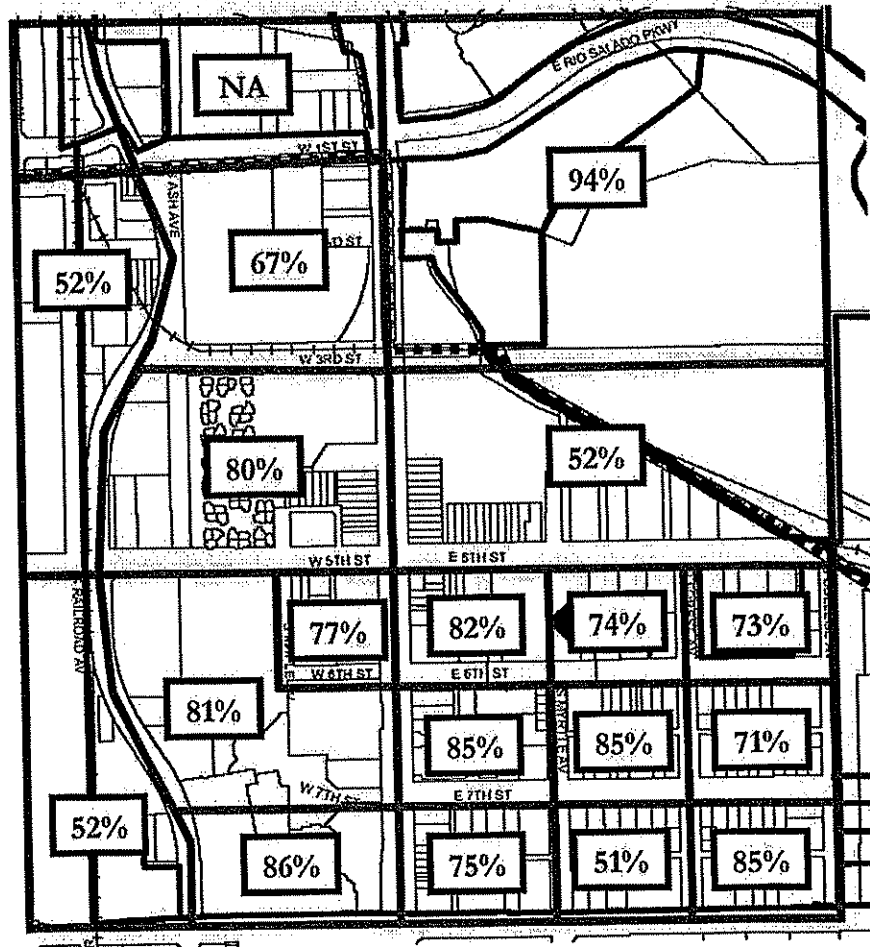
^= Lakeside parking structure not included in the parking occupancy counts.

During the overall peak period of parking occupancy approximately 71.1% of the on-street parking supply and 71.0% of the off-street parking supply was occupied. While the overall observed peak parking demand occurred at 12:00 p.m. on Tuesday, on-street parking occupancy actually peaked at 8:00 p.m. on Thursday. Parking demand was greater during the week than on weekends, primarily due to the existing mix of land uses in the downtown (e.g., significant amount of office space). However, weekend evenings had higher parking occupancies after 10:00 p.m. than were observed on weekday evenings.

The following graphic provides a summary of overall off-street and on-street parking occupancies during the observed peak period of parking. Eight of the survey blocks had

parking occupancies of greater than 80%, and an additional five had occupancies greater than 70%.

Figure 6. Overall Parking Occupancy at Peak (%) – Tuesday 12 p.m.



In order to provide a more useful parking adequacy model, the study area was divided into four separate parking quadrants. The parking quadrants provide a more uniform means of looking at current parking occupancy. Viewing parking occupancy from the perspective of the overall study area, while useful in gauging the overall health of the system, does not provide a picture of the parking environment in adequate detail. Some areas in the

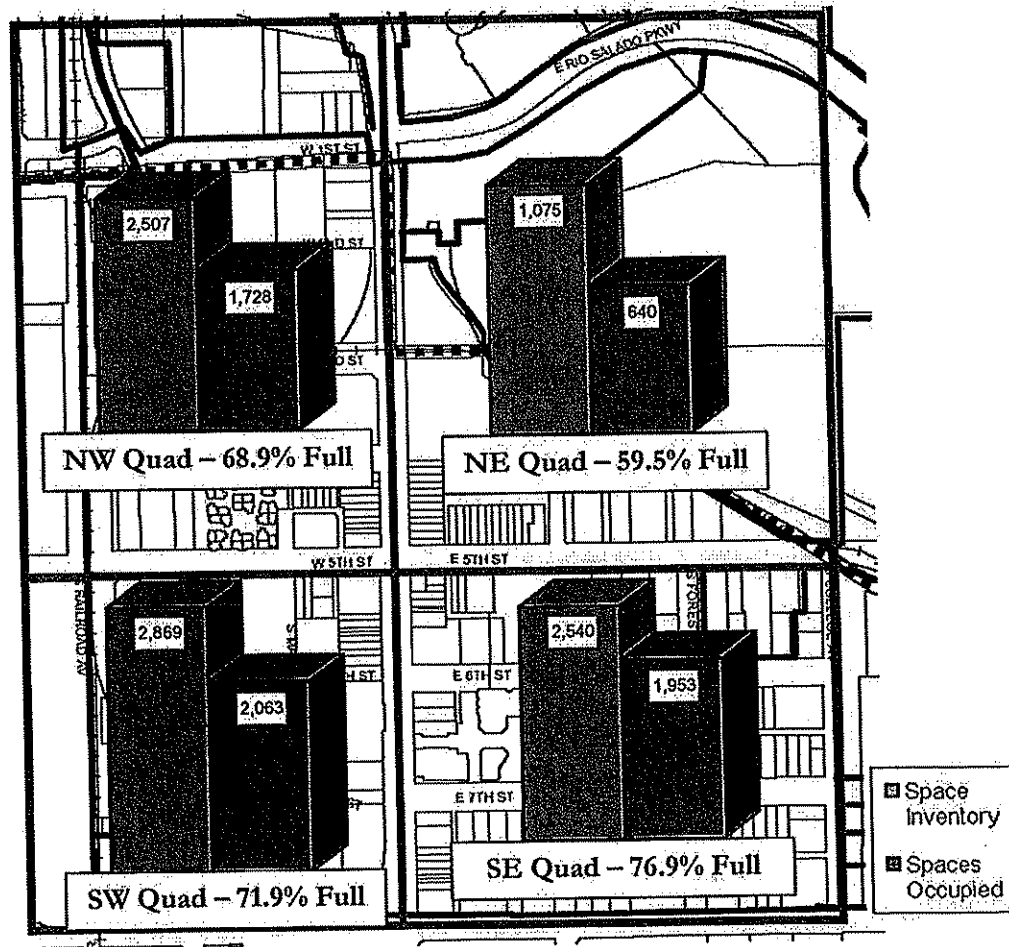
downtown may have plenty of available parking while other areas may not have enough. Also, looking at the parking occupancy on a block-by-block basis is not entirely accurate, since some blocks have far more parking than others.

Breaking up the study area into multi-block quadrants provides an intermediate picture of parking adequacy, and also takes into account patron walking distances. As future parking needs are determined, parking supplies and occupancies should be reviewed on primarily a quadrant basis. The four zones created were:

- Southeast Quadrant – Blocks 1 through 9
- Southwest Quadrant – Blocks 10 through 13
- Northeast Quadrant – Blocks 18 and 19
- Northwest Quadrant – Blocks 14 through 17

The following graphics illustrate the boundary of each zone, as well as the observed parking occupancy during the peak period of parking (Tuesday at 12:00 p.m.) for each zone.

Figure 7. Parking Occupancy by Zone – Tuesday 12:00 p.m.



2.03. Current Parking Adequacy

In determining the current parking adequacy for the study area, it is important to define two terms typically used in analyzing parking adequacy: Effective Supply and Design Day Conditions. When a parking area's occupancy reaches 85-90% of the total capacity, depending on the user group, the area becomes effectively full. When parking lot occupancy exceeds effective capacity, users become frustrated as it becomes increasingly difficult to find an available parking space. Users will begin to either park illegally in the lot or leave the lot

altogether and search for parking elsewhere. In a downtown environment, when visitors are faced with significant parking difficulties, they will often avoid the downtown altogether and shop in the suburbs. The accepted effective fill percentage for parking in the downtown study area is 90%. This 10% "cushion" of spaces is used to accommodate spaces lost temporarily due to construction, improper or illegal parking, and provides for shorter searches for available parking.

Design day parking conditions attempt to represent typical peak activity that may be exceeded only occasionally during the year. Due to the limited nature of the occupancy study for this project, as well as the time of the year the surveys were completed, design day adjustments will not be factored into the adequacy model. The occupancy survey that was conducted provided an adequate "snapshot" of conditions during a typical peak period.

The following table illustrates the total observed parking adequacy for the entire study area. The current parking adequacy is based on the observed parking occupancy at the peak parking period (Tuesday at 12:00 p.m.) Overall, there is a substantial surplus of parking available in the downtown.

Table 3. Current Overall Parking Adequacy

		Number of Spaces
Current Total Parking Supply		8,991
Current Effective Parking Supply (90% of Total)		8,092
Observed Parking Occupancy	71.0%	6,384
Current Effective Parking Surplus/Deficit		1,708

Based on the effective parking supply of the study area, there is currently a parking surplus of 1,708 spaces or approximately 21% of the effective supply. This parking adequacy is

based solely on observed parking demand. Based on land use information provided by the DTC, approximately 6.8% of the available building space in downtown is vacant. Therefore, observed parking demand may be lower than the demand that would be calculated for the individual downtown land uses.

It is important to note however that while a significant parking surplus exists in almost all areas, most of the parking is private and use is restricted. Of the total off-street and on-street parking supply in the study area, approximately 35% (3,480 spaces) is available for general public parking while the remaining 65% (6,464 spaces) is restricted to private parking (e.g., employee only, specific customers only). At the overall peak parking period (Tuesday at 12:00 p.m.), 82% of the surveyed public parking supply (on and off-street) and 65% of the surveyed private parking supply were utilized. Adjusting these numbers for a 10% effective supply, approximately 91% of the public parking supply was effectively full.

Parking adequacy was also estimated based on the parking quadrants described in Section 2.02. The following parking adequacy tables illustrate the amount of available parking within each designated zone, the effective parking supply, and the observed occupancy. These tables illustrate parking adequacy based on the different peak parking periods in each zone. As with the overall adequacy calculation, the on-street and off-street supplies are combined.

Table 4. Parking Adequacy – Southeast Quadrant		Number of Spaces
Current Total Parking Supply		2,540
Current Effective Parking Supply (90% of Total)		2,286
Observed Parking Occupancy	76.9%	1,953
Current Effective Parking Surplus/Deficit		333

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Table 5. Parking Adequacy – Southwest Quadrant

		Number of Spaces
Current Total Parking Supply		2,869
Current Effective Parking Supply (90% of Total)		2,582
Observed Parking Occupancy	71.9%	2,063
Current Effective Parking Surplus/Deficit		519

Table 6. Parking Adequacy – Northeast Quadrant

		Number of Spaces
Current Total Parking Supply		1,075
Current Effective Parking Supply (90% of Total)		968
Observed Parking Occupancy	59.5%	640
Current Effective Parking Surplus/Deficit		328

Table 7. Parking Adequacy – Northwest Quadrant

		Number of Spaces
Current Total Parking Supply		2,507
Current Effective Parking Supply (90% of Total)		2,256
Observed Parking Occupancy	68.9%	1,728
Current Effective Parking Surplus/Deficit		528

All of the zones in the study area currently have significant surpluses of available parking. The Southeast Quadrant currently has the smallest percentage of surplus parking at 14.5% of the effective supply. The Northeast Quadrant currently has the largest percentage of surplus with 33.9% of the effective supply.

When looking at the parking adequacy of each of the quadrants, it is also important to review the utilization of the public parking supply as well. Based on the occupancy surveys, the public parking adequacy of each quadrant is as follows (effective supply factor is 90%):

- Southeast Quadrant:
 - Total public parking supply is 1,299 spaces:
 - On-street: 314 spaces
 - Off-street: 985 spaces
 - Effective public parking supply is 1,168 spaces:
 - On-street: 282 spaces
 - Off-street: 886 spaces
 - Observed public parking occupancy was 1,075 spaces total:
 - On-street: 255 spaces
 - Off-street: 820 spaces
 - Public parking adequacy is a surplus of 93 spaces:
 - On-street: 27 space surplus
 - Off-street: 66 space surplus
- Southwest Quadrant:
 - Total public parking supply is 935 spaces:
 - On-street: 43 spaces
 - Off-street: 892 spaces
 - Effective public parking supply is 840 spaces:
 - On-street: 38 spaces
 - Off-street: 802 spaces
 - Observed public parking occupancy was 805 spaces total:
 - On-street: 29 spaces
 - Off-street: 776 spaces
 - Public parking adequacy is a surplus of 35 spaces:

- On-street: 9 space surplus
- Off-street: 26 space surplus
- Northeast Quadrant:
 - Total public parking supply is 34 spaces:
 - On-street: 34 spaces
 - Off-street: 0 spaces
 - Effective public parking supply is 30 spaces:
 - On-street: 30 spaces
 - Off-street: 0 spaces
 - Observed public parking occupancy was 19 spaces total:
 - On-street: 19 spaces
 - Off-street: 0 spaces
 - Public parking adequacy is a surplus of 11 spaces:
 - On-street: 11 space surplus
 - Off-street: N/A
- Northwest Quadrant:
 - Total public parking supply is 1,088 spaces (not including Tempe Beach):
 - On-street: 97 spaces
 - Off-street: 991 spaces
 - Effective public parking supply is 978 spaces:
 - On-street: 87 spaces
 - Off-street: 891 spaces
 - Observed public parking occupancy was 840 spaces total:
 - On-street: 44 spaces
 - Off-street: 796 spaces
 - Public parking adequacy is a surplus of 234 spaces:
 - On-street: 43 space surplus
 - Off-street: 191 space surplus

2.04. Shared Parking Analysis Summary

Another way to evaluate parking supply and demand is through the concept of shared parking. Shared parking is defined as parking that can serve more than one single land use, without conflict. Shared parking is generally applied to mixed-use developments, or downtown developments composed of several different land uses (e.g., retail, office, theater) that are significantly integrated. Using the shared parking model reduces the amount of parking needed for a mixed-use development (or other groupings of adjacent land uses), as the effect of sharing parking requires fewer spaces than the sum of the parking needed for the individual land uses. This analysis calculates the parking needed based on the current land uses in the downtown, and projects a hypothetical parking accumulation throughout a typical weekday and weekend day (6:00 a.m. through 12:00 a.m.)

The following table details the current land uses in the study area, by block and by quadrant. The downtown land use data used in this report was provided by the DTC.

Table 8. Current Downtown Land Uses

Parking Zone	Block #	1 Office*	2 Restaurant	3 Bar	4 Theater^	5 Retail	6 Hotel Rooms	7 Medical Office	8 Residential Units	9 Church	10 Service	11 Bank	12 Child Care	13 Warehouse	14 Call Center	15 Instruction	16 Vacant
Southeast	1	8,496	6,730			15,000				21,970	4,791						3,700
	2		14,031			6,150					4,419						4,932
	3	16,709	11,235			2,160			16	7,250	3,262	5,967					5,451
	4	186,407	38,484	4,569		40,151			84		60	4,725					3,500
	5		3,926			1,200				41,290			864				
	6	2,200							12								
	7	35,754	2,700	3,820		778			173								2,635
	8	8,300			800												
	9	93,781	12,910	15,643	240	12,019											
Southeast Totals		351,647	90,016	24,032	1,040	77,458	0	0	285	70,510	12,532	10,692	864	0	0	0	20,238
Southwest	10	3,346	18,109		2,113	20,046									300,455		15,248
	11					15,645											12,188
	12	78,039	10,362	3,708		5,987	160										1,368
	13	25,370	800			14,687					5,336	8,240		2,960			
Southwest Totals		106,755	29,271	3,708	2,113	56,365	160	0	0	0	5,336	8,240	0	2,960	300,455	0	28,824
Northwest	14	85,987	25,189	28,118		15,367			118		5,238					3,241	36,368
	15	221,517	20,666														25,460
	16	4,407	9,100					2,280									10,988
	17															3,241	72,816
Northwest Totals		311,971	54,955	28,118	0	15,367	0	2,280	118	0	5,238	0	0	0	0	3,241	72,816
Northeast	18	188,000	10,000			9,500											15,492
	19	100,434	3,283	3,825		4,812	303										
	20																
Northeast Totals		288,434	13,282	3,825	0	14,312	303	0	0	0	0	0	0	0	0	0	15,492
Totals		1,058,807	187,524	59,683	3,153	163,502	463	2,280	403	70,510	23,106	18,932	864	2,960	300,455	3,241	137,570

Notes: * = Government land uses calculated as office.
^ = Theater land uses reflect the number of seats at the venue.

After totaling the various land uses located in downtown Tempe, two separate shared parking models were utilized. First, the standard Urban Land Institute (ULI) shared parking model was used to estimate downtown parking needs. Then, the approved City of Tempe shared parking model was used to calculate parking needs. The results of each model were compared after calculating the estimated parking demands. The parking ratios and hourly vehicle accumulation projections for each model are included in Appendix B.

The following tables summarize the results of the shared parking analysis for the study area, by block and by quadrant (the number of spaces includes only surveyed spaces).

Table 9. Shared Parking Results by Block

Block #	# of Spaces	Observed Peak Occupancy *	% Occupied	Observed Peak Day/Time	Shared Parking Models	
					Adjusted ULI Shared Parking ^	City of Tempe Shared Parking
1	239	203	84.9%	Tue. (12 pm)	375	289
2	190	114	60.0%	Fri. (12 pm)	251	219
3	237	177	74.7%	Tue. (12 pm)	304	228
4	709	605	85.3%	Tue. (12 pm)	1,220	1,202
5	193	182	94.3%	Fri. (12 pm)	475	430
6	238	195	81.9%	Tue. (10 pm)	27	24
7	529	385	72.8%	Tue. (12 pm)	377	457
8	155	149	96.1%	Fri. (12 pm)	320	277
9	50	58	116.0%	Fri. (10 pm)	476	599
10	1,273	1,094	85.9%	Tue. (12 pm)	1,267	3,064
11	1,092	564	51.6%	Tue. (12 pm)	64	52
12	426	378	88.7%	Fri. (12 pm)	554	457
13	78	71	91.0%	Tue. (12 pm)	212	190
14	974	810	83.2%	Fri. (12 am)	948	1,269
15	1,028	770	74.9%	Fri. (12 pm)	904	882
16	505	260	51.5%	Tue. (12 pm)	209	205
17						
18	185	174	94.1%	Tue. (12 pm)	732	719
19	890	466	52.4%	Tue. (12 pm)	690	534
OVERALL	8,991	6,384	71.0%	Tue. (12 pm)	7,328	9,706

Notes:

* = Peak occupancy shown is for each individual block, and the overall peak encompasses the entire study area.

^ = Includes estimated church and vacant space demand (per City of Tempe demand ratios).

Table 10. Shared Parking Results by Quadrant

Quadrant	# of Spaces	Observed Peak Occupancy	% Occupied	Observed Peak Day/Time	Shared Parking Models	
					Adjusted ULI Shared Parking ^	City of Tempe Shared Parking
SE	2,540	1,953	76.9%	Tue. (12 pm)	2,515	3,068
SW	2,869	2,063	71.9%	Tue. (12 pm)	1,854	3,611
NE	1,075	640	59.5%	Tue. (12 pm)	1,344	1,249
NW	2,507	1,728	68.9%	Tue. (12 pm)	1,722	2,043

Notes:

^ = Includes estimated church and vacant space demand (per City of Tempe demand ratios).

As stated previously, 953 parking spaces located within the study area were not included in the parking occupancy surveys. The majority of these spaces were contained in the Hayden Ferry Lakeside Parking Structure (755 spaces).

The ULI shared parking model appears to more closely represent the parking demands observed in the downtown study area. Overall, the ULI model estimates a parking demand of 7,328 to 7,435 parking spaces. This is approximately 1,000 spaces more than were occupied during the peak period of parking demand. The standard City of Tempe shared parking model was much less representative of the observed parking demand, estimating an overall need for between 9,706 to 9,971 parking spaces. This is over 2,000 spaces more than the demand estimated by the ULI model, and over 3,000 spaces more than the observed peak parking occupancy. The differences in the two models come primarily from the higher parking demand ratios required by the City of Tempe for call center, restaurant and theater land uses.

The existing city code provides flexibility in determining the number of parking spaces required for individual developments. The code provides standard approved parking demand ratios, a provision for a shared parking model and other alternative methods that

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could be approved by the city with a report from an experienced consultant. The current parking code divides parking space requirement ratios into residential and non-residential land uses. In reviewing this portion of the zoning code, *Carl Walker* compared City of Tempe parking requirements to three typical industry standards. The land uses included in the comparison account for those that are currently found in downtown Tempe. The following matrix (Table 11) summarizes the results of the parking requirement comparison.

Table 11. Parking Ratio Comparison

City of Tempe	National Parking Association (1992)	Urban Land Institute (2005)	Institute of Transportation Engineers (2004)	Comparison
Office				
1 space per 300 s.f.	General Office less than 30,000 s.f.: 1 space per 278 s.f. (approx.) General Office more than 30,000 s.f.: 1 space per 333 s.f. (approx.)	General Office less than 25,000 s.f.: 1 space per 263 s.f. (approx.) General Office between 25,000 s.f. and 100,000 s.f.: 1 space per 294 s.f. (approx.)	1 space per 352-417 s.f. (approx.)	The average parking ratio for general office is 1 space per 311 s.f. This average requirement is lower than the current City of Tempe standard.
Restaurants				
Indoor: 1 space per 75 s.f. Outdoor: 1 space per 150 s.f. or 1 space per 4 seats if no patio wall.	Quality Restaurant: 1 space per 50 s.f. Family Restaurant: 1 space per 83.33 s.f. (approx.) Fast Food: 1 space per 62.5 s.f. of kitchen, serving counter and waiting area plus .5 spaces per seat.	Fine Restaurant: 1 space per 50 s.f. Family Restaurant: 1 space per 67 s.f. (approx.) Fast Food: 1 space per 67 s.f. (approx.)	Quality Restaurant: 1 space per 58 s.f. (approx.) Fast Food: 1 space per 81-122 s.f. (approx.)	The average industry requirement is approx. 1 space per 62 s.f. The average industry requirement is higher than the current City of Tempe requirement. There is no difference in establishment types in Tempe's code.
Bars/Nightclubs				
1 space per 50 s.f.	N/A	1 space per 61 s.f. (approx.)	1 space per 60 s.f. (approx.)	City of Tempe requirements are higher than average industry standards.
Theater				
1 space per 3 seats.	N/A	Up to .27 spaces per seat (or 1.08 spaces for every 4 seats).	.26 spaces per seat (or 1.04 spaces for every 4 seats).	The City of Tempe requires more parking than industry ratios.
Retail				
Indoor: 1 space per 300 s.f. Outdoor: 1 space per 500 s.f. Convenience Store: 1 space per 300 s.f. Furniture: 1st 10,000 s.f. @ 1 space per 500 s.f., then 1 space per 5,000 s.f. remaining.	General Retail: 1 space per 303 s.f. (approx.); Service Retail: 1 space per 417 s.f. (approx.); Shopping Centers: 1 space per 250 s.f. for centers up to 400,000 s.f.	Community Shopping less than 400,000 s.f.: 1 space per 250 s.f.	General Shopping: up to 1 space per 211 s.f. (approx.)	The average general industry retail requirement is approximately 1 space per 255 s.f. The current City of Tempe requirement is lower.

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City of Tempe	National Parking Association (1992)	Urban Land Institute (2005)	Institute of Transportation Engineers (2004)	Comparison
Hotel				
1 space per unit plus office space	1 space per room plus additional parking for other land uses (e.g. restaurants, retail, etc.) and 1 space for every four employees during peak employment shift.	1.15-1.25 spaces per room.	.91 spaces per room.	Depending on the land uses beyond typical hotel rooms, the current Tempe requirement is slightly lower than industry standards.
Residential				
Single-family requirement is 2 spaces per unit.	2 spaces per dwelling unit.	Residential - Owned: 1.5 spaces per unit plus .15 spaces for guests.	1.83 spaces per unit.	The requirements for the City of Tempe are higher than those typically recommended in the industry. The average industry recommendation is 1.83 for single family detached and 1.86 for attached dwellings.
Multi-family ranges from 1.2 to 3.2 spaces per unit based on the number of bedrooms.	1.25 spaces (studio apartments) to 2 spaces per dwelling unit.	Residential - Rented: 1.7 spaces per unit plus .15 spaces for guests.	1.00 - 1.73 per unit.	
Medical Office				
1 space per 150 s.f.	Medical Office Buildings: Less than 5,000 s.f.: 1 space per 167 s.f. (approx.); Over 5,000 s.f. is 1 space per 182 s.f. (approx.)	Medical Office: 1 space per 222 s.f. (approx.)	1 space per 283 s.f. (approx.)	The average for medical office buildings is 1 space per 214 s.f. The City of Tempe requirement is higher.
Church				
1 space per 100 s.f. for sanctuary plus school, etc.	While there is no church category, public assembly is .25 per person in permitted capacity.	NA	1 space per 128 s.f. (approx.)	The City of Tempe requirement appears higher than industry standards.
Service				
1 space per 300 s.f.	1 space per 417 s.f. (approx.)	NA	NA	The City of Tempe requirement is higher than the available industry standard.
Bank				
1 space per 300 s.f.	1 per 250 s.f. up to 30,000 s.f., 1 per 303 s.f. (approx.) for over 30,000 s.f.	1 spaces per 217 s.f. (approx.)	1 space per 435 s.f. (approx.)	The industry average standard is approx. 1 space per 302 s.f.
Child Care				
1 space per 300 s.f.	1 space per employee, plus .1 space per enrolled person, plus 1 drop-off space per eight enrolled persons.	NA	1 space per 316 s.f. (approx.)	The City of Tempe requirement appears higher than industry standards.
Warehouse				
1st 10,000 s.f. @ 1 space per 500 s.f., then 1 space per 5,000 s.f.	.5 spaces per 1,000 s.f., plus any office, sales, etc. use requirements.	NA	.41 spaces per 1,000 s.f.	The City of Tempe requirement is higher than industry standards.
Call Center				
1 space per 150 s.f.	NA	NA	NA	No comparison available.

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City of Tempe	National Parking Association (1992)	Urban Land Institute (2005)	Institute of Transportation Engineers (2004)	Comparison
Instructional				
1 space per 200 s.f. of classroom space.	NA	NA	NA	No comparison available.
Vacant Land				
Calculated at 1 space per 300 s.f.	NA	NA	NA	No comparison available.

In some cases, the parking required by the City of Tempe is slightly higher than typical industry standards. The parking demand ratios recommended in the industry can be useful in projecting possible parking demands for planning purposes. However, it is important to keep in mind that industry parking demand ratios are based on data collected across the country, and the parking demand generated by land uses in one municipality may differ greatly from those generated in another. Also, other factors such as land use density, captive market impacts and the use of alternative modes of transportation can impact parking demand. A copy of the parking demand ratios formulated by the Urban Land Institute are included in the shared parking model provided to the city by *Carl Walker*.

Therefore, no immediate changes to the City of Tempe parking ratios are recommended at this time. A possible exception to this could be a reduction in the parking required for Call Center land uses, or at least a reduction in the projected vehicle accumulations. However, to reduce the likelihood of providing too much parking in the downtown, it is recommended that the city adopt the methodology included in Section 3.03 of this study. This will encourage a higher level of utilization of existing parking resources, and reduce the amount of parking that needs to be provided due to the impact of shared parking.

The shared parking model provided by ULI also provides adjustments for the seasonality of parking. Some land uses experience different parking demands throughout the year, such as movie theater demand peaking during summer months. The previously noted parking demand estimate calculated using the ULI shared parking model reflects the peak month of

parking. However, if the shared parking calculation for the month during which the occupancy counts were conducted (April) were used, the ULI calculated parking demand would range from 7,126 to 7,145 spaces. This is within 12% of the level of parking demand observed during the parking occupancy counts. The City of Tempe shared parking model does not provide an adjustment for seasonality.

There are other forces impacting the parking demand observed in the study area that are not necessarily addressed by the shared parking models, or quantifiable from the data gathered during the parking occupancy surveys. Among these factors are drive ratios (the ratio of people driving in single occupancy vehicles to the land use versus using another form of transportation) and captive market ratios (the ratio of people using more than one land use).

It is also important to note that these shared parking models assume that the parking supply on each block, and within each quadrant, can reasonably be used by any potential parker visiting a land use. The applicability of the shared parking concept can be diminished as parking spaces are reserved for specific user groups.

The individual results of the shared parking models are contained in Appendix C.

3. Future Parking Supply and Demand

3.01. Future Downtown Tempe Development Projects

Currently, the DTC anticipates 12 future development projects that could impact parking conditions in the study area. These projects include residential, retail, restaurant and office projects. While not all of the details of each of the anticipated developments are known at this point, estimates have been made concerning seven potential parking system impacts. The seven potential developments with known parking issues are as follows:

1. Residential Project at the Armory – A 364-unit residential development is currently planned for the former National Guard Armory property on the east side of the study area. The development will also include approximately 37,800 s.f. of retail space and 673 new parking spaces. Approximately 112 public parking spaces will be lost in the construction of the development (resulting in a net parking gain of 561 spaces). The development has been estimated to need approximately 673 parking spaces by the City of Tempe.
2. Centerpoint Condominium Development – A 788-unit residential development is currently underway for the area north of the existing Harkins Theater in the Southwest Quadrant of the study area. The development will also include approximately 37,609 s.f. of retail space and 1,829 new parking spaces. The parking spaces lost in the development have already been included in the current parking supply. A parking demand of 2,027 parking spaces for this project has been estimated by the City of Tempe.
3. Cosmo Building Development – The Cosmo Building is a mixed-use development to occur in the southwest corner of the Southwest Quadrant. The development is anticipated to include 115 residential units and approximately 53,000 s.f. of retail

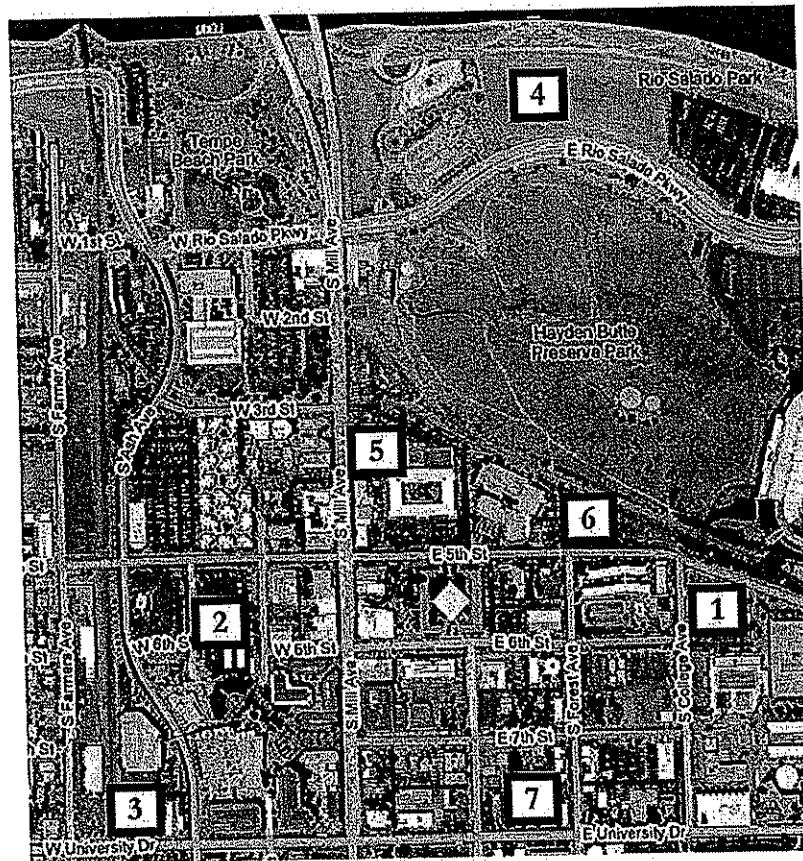
space. The development will also include approximately 646 new parking spaces. Approximately 82 parking spaces will be lost in the construction of the development (resulting in a net parking gain of 564 spaces). The development has been estimated to need approximately 541 parking spaces by the City of Tempe.

4. Continued Development at Hayden Ferry – The continued development of the Hayden Ferry property is anticipated to include a total of 410 residential units, 35,899 s.f. of new retail space, 35,899 s.f. of new restaurant space, 706,700 s.f. of new office space, and 200 hotel rooms. The overall development will include approximately 4,144 parking spaces. The development has been estimated to need approximately 3,734 parking spaces by the City of Tempe.
5. Tempe Mission Palms Expansion – An expansion of the Tempe Mission Palms is anticipated, including 200 new hotel rooms and approximately 6,000 s.f. of restaurant space. The development will result in the loss of approximately 84 parking spaces, and no new spaces are planned to be constructed as part of the development. Based on the anticipated land uses, the development would be estimated to need approximately 276 parking spaces based on existing city code.
6. Downtown Transit Center – A Downtown Transit Center is currently under construction on the former East Hall Lot in the Northeast Quadrant. This development will result in the loss of approximately 180 parking spaces.
7. University Square Development – A mixed-use development is planned for the southern portion of the Southeast Quadrant (adjacent to University Drive) that would include 350 hotel rooms, 422 residential units and approximately 240,000 s.f. of office space. The development will result in the loss of approximately 190 parking spaces, but 2,188 new parking spaces are planned to be constructed as part

of the development. The development has been previously estimated to need approximately 2,020 parking spaces.

Five additional development projects are in the early stages of development, but do not have sufficient detail necessary to project parking demands. The following graphic illustrates the approximate location of each of the listed development projects (identified by number).

Figure 8. Anticipated Development Projects



3.02. Future Parking Adequacy

Each of the aforementioned development projects will impact existing parking supplies and demand. To project future parking adequacy, the anticipated parking demands for each

development project were estimated using existing City of Tempe parking requirements. Then, the estimated parking demand was compared to the available parking within the quadrant each development is anticipated to be located. The following table illustrates the projected parking adequacy impact of each project.

Table 12. Future Parking Adequacy Summary

Project	Estimated Parking Demand per City Requirements*	Parking Supply Included with Project	Quadrant Parking Surplus#	Parking Quadrant Surplus/Deficit After Development
1. Residential Project at the Armory	673 spaces^	673 spaces (475 for residents)	SE Quad - 333 space surplus	Existing surplus - 112 spaces lost - new demand + 673 new spaces = 221 space surplus
2. Centerpoint Condominium Development	2,027 spaces^	1,829 spaces (1,375 for residents) - Approved by Variance.	SW Quad - 519 space surplus	Existing surplus - new demand + 1,839 new spaces = 321 space surplus
3. Cosmo Building Development	541 spaces^	646 spaces (364 for residents)	SW Quad - 321 space surplus (after Centerpoint)	Existing surplus - 82 spaces lost - new demand + 646 new spaces = 344 space surplus
4. Continued Development at Hayden Ferry	3,734 spaces^	4,144 spaces (864 for residents)	Not Applicable due to Distance	Possible surplus of 410 spaces.
5. Tempe Mission Palms Expansion	276 spaces	0 spaces	NE Quad - 328 space surplus	Existing surplus - 84 spaces lost - new demand = 32 space deficit
6. Downtown Transit Center	N/A	0 spaces	NE Quad - 32 space deficit	Existing deficit - 180 spaces lost = 212 space deficit
7. University Square Development	2,020 spaces@	2,188 spaces (622 for residents)	SE Quad - 221 space surplus (after the Armory Project)	Existing surplus - 190 spaces lost - new demand + 2,188 new spaces = 199 space surplus

* - Using the City of Tempe Shared Parking Model (if applicable)

- From the period of greatest overall parking occupancy - Wednesday

^ - Parking demand calculated by the City of Tempe

@ - Estimated parking demand based on a shared parking model, but not calculated by the city

Currently, most of the development projects anticipated by the DTC will not result in the development of negative parking adequacies. However, this assumes that available private

parking supplies could be tapped to provide shared parking for new and existing developments.

However, the anticipated developments in the Northeast Quadrant are currently anticipated to result in parking deficits, even if existing public and private parking supplies are used to help offset projected demands. This will mean that future employees, residents, and visitors of the developments contained in these areas will need to walk greater than two blocks from available parking to their primary destinations, or additional parking supplies will be needed. This will also increase the perception of the public and local merchants that there is insufficient parking during peak periods of parking occupancy in certain areas.

Again, the lack of more significant parking shortages illustrated in Table 9 assumes that visitors and employees will be willing to walk a minimum of one to two blocks to reach their desired destinations. Please note that the projection of future parking conditions does not include any adjustments relative to the impact of captive market conditions or the use of alternative modes of transportation. The completion of the light rail line through Tempe may result in lower parking demands in the future.

Another important issue is the utilization of available public parking supplies. As mentioned previously, there is currently a parking supply of 3,356 spaces available to the general public (effective supply of 3,016). Of this supply, currently 2,739 parking spaces are utilized at peak (approximately 91% of the available effective supply). As the demand for general public parking will increase over time, additional public parking supplies will be needed in the future. Also, some of these public parking spaces will be lost to new developments. As the available public parking supply is fairly well utilized currently, anticipated new development projects may not be able to rely on available public parking supplies. Future downtown development projects should be required to provide sufficient visitor parking for their needs,

or help finance new public parking supplies (e.g., in-lieu fees, assessments). The parking impacts of future development projects are estimated as follows:

- **Southeast Quadrant (Armory and University Square Developments):**

The anticipated Armory development will remove 112 existing public parking spaces from the available supply. As the Armory will only provide a number of parking spaces equal to the estimated parking demand generated by the development, a shortage of public parking spaces could occur. The existing public parking lot at the Armory had 48 vehicles parked at peak. This parking demand will have to be accommodated elsewhere.

The University Square development will remove approximately 190 parking spaces from existing supplies. These parking spaces are generally private, serving businesses located on the same block. The development is anticipated to provide approximately 168 parking spaces over the projected parking demand. Therefore, if the excess parking spaces are open to the public, there is a potential that the development could result in an increase in public parking.

The net impact to public parking in the quadrant could be a positive supply of approximately 120 spaces, if the excess University Square parking is open to the public.

- **Southwest Quadrant (Centerpoint and Cosmo Developments):**

The Southwest Quadrant has a currently public parking surplus of approximately 35 parking spaces. The public parking lost to the Centerpoint development was included in the parking inventory and occupancy counts conducted in April 2006. The Cosmo project will not result in the loss of any public parking supplies.

While the Southwest Quadrant has a current overall parking surplus of 519 parking spaces, the majority are located in private parking facilities. Therefore, the amount of surplus parking that can be utilized by the new developments may be limited. The Centerpoint development may create a larger parking demand than can be accommodated in the parking included with the project (if the demand reaches the level estimated by the City of Tempe), while the Cosmo development may result in excess parking. An overall shortage of public parking in the Southwest Quadrant could result if underutilized private parking supplies cannot be used and parking demand for the development projects meet those estimated by the city (approximately 70 spaces or more).

- Northeast Quadrant (Tempe Mission Palms and Downtown Transit Center):
Currently, neither project is anticipated to include any new parking. There is currently a public parking surplus of 11 parking spaces.

The impacts of these developments on the public parking supply are difficult to determine at this time. The Tempe Mission Palms expansion may impact public parking supplies in the quadrant, especially since the expansion is anticipated to include a restaurant. However, the hotel may provide additional parking as part of another nearby development in the future. The Downtown Transit Center may or may not generate significant parking demand. While the primary purpose of the center is to function as a transfer point for various alternative modes of transportation, some users may park nearby and then catch a bus or the light rail. Therefore, additional analysis will be required once more is known about these projects. However, these developments will most likely negatively impact public parking in the quadrant unless additional parking is provided.

Another issue that can greatly impact future parking adequacy in the study area is the continued growth of Arizona State University (ASU). With an overall campus population of over 60,000 faculty, staff and students, the parking demands generated by the campus can often spill over into adjoining areas. The high level of parking demand, coupled with reductions in campus parking supplies and increases in parking fees, could lead to some members of the ASU community utilizing public parking in downtown Tempe (in addition to those already parking downtown to visit ASU offices/classes located in the study area).

ASU is currently projecting significant losses of parking due to anticipated campus development projects. While some of this parking may be added back into newly created parking facilities, up to 5,000 campus parking spaces could be lost in the next five years. With an estimated 35,000 vehicles driven to campus each day, this loss of parking can have dramatic results on the areas surrounding the campus.

In order to address future parking demands, ASU is focusing on several alternatives designed to reduce parking needs. These alternatives include improving local and remote campus transit, improving accommodations for other alternative modes of transportation (e.g., bicycles, pedestrians), developing remote parking lots (perhaps on the light rail route), increasing parking permit rates (to encourage the use of alternative modes of transportation), and working with the City of Tempe concerning planning and transportation issues. The University appears committed to meeting the transportation needs of the campus community without creating undue hardships on the surrounding community.

However, it may prove difficult for ASU to provide enough transportation options to completely eliminate the possibility that some ASU students and staff members may parking downtown. Therefore, additional steps may need to be taken by the DTC to help mitigate the impacts of overflow ASU parking in the downtown. Options could include increasing parking rates to match ASU rates, strictly enforcing on-street parking time limits, using

merchant validation programs to discourage the use of public parking by ASU community members (e.g., requiring a purchase for parking validations) and working closely with ASU to find other alternatives for meeting campus parking demands (e.g., development of remote parking lots, increased transit).

3.03. Planning for Future Parking Needs

The current vision for downtown Tempe includes many elements. The downtown is planned to become an even more important social and commercial center, with the continued development of new retail and office space as central focal points. The anticipated development plans also include a significant amount of new residential space. This vision will result in higher parking demands, and denser land uses, than the current environment.

In order to address future parking needs not currently anticipated, *Carl Walker* recommends the follow methodology:

- Ensure the land use information for the downtown is current. This will provide additional insight into existing parking demands. The land use data should be updated as new developments occur.
- The first step in planning for future parking needs is to determine typical parking demands. This is usually achieved by completing a parking supply and demand survey. As was completed as part of this study, this would entail maintaining current parking space inventories and conducting parking occupancy counts (ideally at twice per year – fall and spring). This will provide a baseline of demand data from which to project future parking needs. These surveys will also help determine the correct

mix of short-term and long-term parking (based on the utilization of each type of parking).

- Project the parking needs of each proposed development using either existing City parking requirements or the ULI Shared Parking Model. As shown previously, the ULI Shared Parking Model may better represent potential parking demands. Determine how parking demand for the new development will fluctuate during the day by using a shared parking model. Determine how parking demand for the proposed development will impact parking supplies during the observed peak parking period (or the period of greatest parking demand). Where applicable, factor in possible parking demand reductions due to captive market effects and alternative modes of transportation.
- Use the concept of shared parking to ensure the efficient use of available parking supplies (especially for mixed-use developments). Again, shared parking is defined as parking that can serve more than one single land use, without conflict. An electronic shared parking spreadsheet will be provided to the city, based on the model created by the Urban Land Institute.
- Once parking demands have been projected, determine how the development will impact existing conditions. If the development creates a parking deficit within the zone where it is located (the zone would typically be a one or two block radius surrounding the development, or the associated quadrant), additional on-site or off-site parking supplies will be necessary.
- While the parking demand for many land uses can be spread over greater distances, the creation of residential space in the downtown should include sufficient on-site parking. Residential projects that lack sufficient parking are rarely marketable, and

conflicts will arise should the use of public parking spaces be necessary. However, additional analysis may be necessary to accurately determine residential parking demands in the downtown. Urban residential land uses typically have lower parking demands than suburban residential developments, as more alternative transportation options exist and vehicle needs are reduced.

- Future downtown developments should include sufficient ADA accessible parking on-site. The city could require developments to provide a suitable portion of their required parking on-site (or directly adjacent to the site) to ensure enough accessible parking is provided.

When parking is planned for new developments, or when new public parking supplies are created, sufficient accessible parking must be provided (as required by federal and state guidelines). Sometimes, parking demand for accessible parking may be larger than the minimum requirements. In order to ensure sufficient space is provided, periodic reviews of accessible parking demand should be part of larger parking inventory and occupancy surveys. Through periodic occupancy studies, and community input, the city will be in position to ensure sufficient accessible parking is provided.

- Existing and future surface parking lots should include landscaping and/or shade structures that can provide shade to parked vehicles. This could be accomplished through the use of fast growing, low water use shade trees. These trees can be planted around parking lots and in internal landscaped islands. Pedestrian paths to/from parking facilities should also provide shade in a similar fashion.

4. Parking Alternatives Analysis

After reviewing the current parking adequacy in downtown Tempe, and projecting the future adequacy, it is clear that new developments may lead to possible parking deficits in up to two study area quadrants (Southwest and Northeast Quadrants). The amount of any future parking shortages will depend on how much, if any, of the private parking supply in each of the four quadrants could be tapped to provide parking for developments. If the available parking surplus in each quadrant cannot be fully utilized, greater parking deficits could result. In any case, additional development projects in the future could lead to parking deficits.

To meet future parking demands, several options are available to the DTC and the City of Tempe:

- The DTC/city could decide to work with private parking lot owners within the impact areas to better utilize existing parking supplies. Using the concept of shared parking, existing parking resources could be more effectively utilized to meet needs.
- The DTC/city could create additional parking spaces (primarily new off-street spaces) to provide additional parking. New surface parking spaces could be created in existing unimproved areas. The land used for surface parking could be developed in the future to a higher and better use (e.g., land banking). If space is not available for surface parking, or surface parking cannot be located close enough to parking demand generators, structured parking could become a viable option. The cost for providing parking could be covered through parking user fees and/or fees charged to developers (e.g., in-lieu fees, special assessments, development fees).
- The DTC/city could require new downtown developments to provide sufficient parking. New developments would provide their own parking for employees and

visitors. This will result in higher costs for developers and very likely the overdevelopment of parking supplies.

- The city could utilize a combination of alternatives.

With any of these alternatives, it is important to provide adequate considerations for alternative modes of transportation. This would include adequate pedestrian paths, bicycle paths and parking, transit stops and accommodations for other alternative modes of transportation.

In the **First Alternative**, the DTC would work with downtown parking lot owners to better utilize available parking supplies. This would mitigate the need to construct additional parking. As sufficient parking is currently available in most areas where development is planned (based on the parking occupancy study), this alternative has merit. Better utilizing the available supply would at least reduce the need for future parking supply additions, maintain existing vacant land or future development space, encourage pedestrian movement through the downtown and reduce city parking responsibilities (e.g., maintenance, signage). The utilization of some currently under-utilized parking supplies could even be improved through a varying rate structure (e.g., high demand parking cost more than low demand parking) coupled with directional signage and appropriate marketing materials (e.g., maps, website, information in local businesses).

Based on the observed occupancy in the downtown, some options could include the use of the existing parking surpluses in the Chase and Centerpoint parking garages and the Fifth and Farmer Lot. These parking facilities could provide up to 550 parking spaces during the peak parking period (based on the completed occupancy survey).

In order to encourage the shared use of private parking facilities, the city could use one or more of the following techniques/incentives:

- The DTC could communicate the positives of shared parking to the private parking lot owners. The positives include increased pedestrian traffic near their businesses, continued downtown development, maintaining future development sites and other non-parking land-uses, easier to use parking for downtown visitors, revenue from parking, etc.
- Shared parking could be limited to evenings and weekends. Signage would need to convey the set parking requirements. This could help provide convenient evening parking around the Southwest and Northwest Quadrants.
- The DTC could provide various incentives for private parking lot owners that agree to allow shared parking. Incentives could include landscape maintenance, periodic lot maintenance, periodic lot cleaning/sweeping, etc.
- The DTC could provide improved and better looking signage for private parking lots. The signage could denote parking restrictions and periods of open public parking.

Communities the size of Tempe typically make arrangements for shared-use parking on an as needed basis, developing agreements with private parking owners permitting public use after certain hours, on weekends, etc. The DTC's existing "Park-It" program organizes a series of privately owned facilities into what appears to be a single parking system. The various parking facilities provide public parking, after the needs of the individual developments are addressed. The system uses a common marketing and signage program providing the appearance of a unified parking system. The DTC operates and manages the private parking

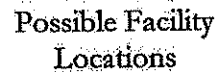
facilities, taking a small percentage of the revenues for covering operating costs and streetscape projects in downtown. The current system shows what is possible with respect to improving the utilization of existing private parking supplies.

However, this approach to dealing with future parking needs may not adequately meet the projected parking deficit. First, the number of parking lot owners willing to cooperate may not be sufficient to provide the necessary parking. Second, the location of available parking supplies may not provide "acceptable" parking to existing and future downtown developments. The available parking supplies may not be within an acceptable walking distance, lot conditions could be poor, etc. Finally, the available parking supply may be insufficient to meet anticipated parking demands.

The Second Alternative available to the DTC is to create additional parking spaces, or improve the capacities of existing lots to provide sufficient parking to meet future demands. This alternative would involve an analysis of existing parking lot physical layouts to determine if improvements could be made to increase lot capacities. Theoretically, both public and private parking supplies could be included in this analysis with the consent of private parking owners. The improved utilization of existing parking areas is substantially less costly than creating new spaces. However, it is unlikely any significant new surface parking could be created by developing new lots or by changing the existing parking lots without sacrificing landscaping/green space.

The DTC or the City of Tempe could decide to construct new structured parking supplies to address unmet future parking demands (either in a publicly financed facility or in a public/private partnership). For example, the DTC or the City of Tempe could construct a new parking structure to meet any unmet demands created by new developments in the Southwest and Northeast Quadrants. To support future projected parking needs, additional structured parking supplies could be included in the potential Fifth and Farmer development

Figure 9. Possible Parking Facility Locations



Carl Walker

Parking Planning Engineering Restoration

operating costs. With typical parking facility construction averaging \$12,000 per parking space, the expense of creating new parking structures can be significant. Third, locating additional parking resources on the perimeter of the downtown would limit the size of the area the facilities could serve. Finally, traffic studies will be needed to ensure the existing street system can handle the traffic generated by the parking facilities. Existing traffic conditions could limit parking facility location options.

The **Third Alternative** available to the DTC/City of Tempe would be to require new downtown developments to provide their own parking resources. This would involve setting parking requirements for new developments, based on projected land uses, and enforcing parking zoning codes. The main advantage to this alternative is that the DTC/City of Tempe would not be required to construct, maintain and operate new parking supplies in the downtown. While some towns and cities require developments to provide their own parking supplies, many downtowns that are encouraging development offer reduced parking requirements or do not use any parking requirements at all. Instead, typically the city works with the development to provide sufficient parking. However, the level of development interest in downtown Tempe may make this incentive unnecessary.

A variation of this alternative is to require developers to pay a fee to cover the creation of new public parking resources. This could be a specific development fee or an in-lieu fee. These fees typically allow developers to pay the city for the right to not create parking for their development. The city would then use the funds to create public parking facilities in the future, when needed.

The use of parking fees like in-lieu can have several advantages:

- Offering parking in-lieu fees provide developers with an option to providing expensive on-site parking. The cost of purchasing the necessary land and funding lot construction is typically more expensive for developers than paying the in-lieu fees.
- Parking in-lieu fees encourage shared parking. As developers stop constructing small private parking facilities, parking is consolidated into larger public parking supplies. This results in a more efficient use of available land, the creation of fewer parking spaces and conditions that encourage pedestrian movement between developments.
- The city would have more control over where parking resources are located and how they are operated and managed.
- As less parking is created, and the parking that is created is consolidated, more space is available for other land uses.

While the use of developer parking fees can provide a lot of benefits to the city, there are also some drawbacks:

- Parking may have to be located less conveniently to primary destinations. As parking is consolidated into fewer locations, some primary destinations will be located further away than if they provided their own parking.
- As the DTC/city creates more public parking facilities, they will have to cover annual operating, maintenance and management costs.
- As shared parking would be used, fewer parking spaces would be created. This could mean more traffic and frustration during unusually high periods of parking demand, such as during special events.

- The use of these fees could discourage development of the downtown in favor of suburban locations with space for surface parking.
- Depending on how the construction of the parking facility is financed, the DTC/city could be limited in how the facility is used to provide parking for private developments.

The fees charged to developers are typically determined by either the cost of land or the typical construction cost of structured parking per parking space. The construction cost per space could be set at the cost to provide either surface or structured parking. For example, a municipality in a similar situation as Tempe may decide to charge developers the current approximate construction cost of a structured parking space at \$12,000 per space (not including land costs and other soft costs). A development that would typically be required to provide 50 parking spaces would therefore be charged \$600,000 in-lieu of providing the necessary parking. This fee could be converted into an impact fee of "X" dollars per square foot by dividing the total calculated parking in-lieu fee by the gross square footage of the development. *Carl Walker* would recommend setting development fees or in-lieu fees at a minimum equivalent of providing structured parking (including typical soft costs of 25%), or at least approximately \$15,000 per space to help fund future parking construction.

The **Final Alternative** is actually a combination of the previous three alternatives. This alternative would involve the DTC working with private parking lot owners to better utilize the existing parking surplus before adding additional parking supplies. If sufficient parking could not be secured using this approach, then the DTC could investigate improving existing parking supplies and/or adding new supplies as appropriate. If new parking spaces were added, either through surface lots, on-street spaces or parking structures, the DTC could look to developers to help defray at least some of the costs. *Carl Walker* recommends this

alternative, as it provides a reasonable approach to dealing with future parking demands and should help limit future parking system expenses. Also, this approach will allow the city to show the community that all options were explored prior to expending city funds for building a parking facility.

In planning to meet future parking needs, it is also important to incorporate other transportation issues. The concept of integrating transportation and parking elements as part of the larger strategic vision for the downtown supports the continuation of the "Park Once – Pedestrian First" planning concept. This concept encourages employees and visitors to park their vehicles in one location and then use another form of transportation to move around the downtown with excellent pedestrian, transit, parking and bicycle facilities. There are three essential elements to achieving this vision, as outlined below (many of which are already being used in downtown Tempe):

- Ensure downtown streets and sidewalks adequately serve the needs of pedestrians, transit users, bicyclists and cars with the focus on serving pedestrians first. This action element can be supported by:
 - The creation of safe, attractive, shaded and inviting pedestrian linkages to connect downtown destinations and parking facilities.
 - Ensuring pedestrian crossings across major streets provide sufficient time for people to cross the street.
 - Where necessary, using traffic calming strategies such as speed humps, lower speed limits, on-street parking, etc.
 - Where possible, including bicycle paths on roadways.

- Providing amenities such as improved lighting, signage, street furniture, landscaping, etc. in public right-of-ways to support and encourage pedestrian activity.
- Bicycle racks, lockers or other bicycle friendly facilities should be provided throughout the downtown.
- Developing, managing and operating parking as an essential civic infrastructure and reducing overall parking ratios over time to create a "Park Once" environment. This action element can be supported by:
 - The usage of in-lieu parking assessments for developments planned in the downtown to support the future funding of strategically located parking resources.
 - Encouraging the "Park-Once" strategy through shared parking for both public and private parking resources.
 - Ensuring all public parking resources are efficiently and effectively designed and managed. Encourage efficient design and management in private parking resources as well.
 - Maximizing on-street parking throughout the downtown and monitoring vehicle duration and turnover. Encourage the turnover of on-street parking through monitoring, communication with downtown business owners and, if necessary, other means such as parking enforcement, higher parking rates, etc.

- Locating long-term parking facilities on the perimeter of the downtown (where feasible) and locate short-term parking throughout the downtown. Ensure the proper mix of parking through periodic parking occupancy counts.
- Incorporating ground floor commercial activity into designs, where appropriate, when additional parking structures are developed in the future.
- Where necessary, improving existing surface parking lots in the downtown (e.g., paving, landscaping, lighting, identification signage).
- Ensuring the downtown is understandable and attractive to infrequent users. This can be supported by:
 - Actively promoting new downtown attractions and developments including parking availability/locations and alternative transportation options. This can be done using printed materials, as well as the city website.
 - Improving the downtown informational and directional (wayfinding) signage program with a special emphasis on available parking resources.

5. Recommendations Summary

Currently, over 70% of the available parking supply in the downtown is occupied during the typical peak parking period. With the level of surplus parking in most areas, coupled with the anticipated amount of parking planned to accompany each development project, it is unlikely that significant new parking resources will be necessary in the immediate future. However, there is a possibility that future developments in the downtown, or those at ASU, could lead to significant parking supply deficits. Therefore, future downtown development may necessitate the development of additional parking resources. With this in mind, *Carl Walker* recommends the following steps be taken by the city (in order of priority):

Short-Term (Within the Next Twelve Months):

1. Develop and approve a set of Guiding Principles for downtown parking. The Guiding Principles will guide the future development of the downtown parking system, as well as provide reasonable constraints within which future parking issues can be addressed.
2. Determine how parking will be provided in the future. Should all developments be required to meet the existing city parking requirements, or will more emphasis be placed on utilizing alternative modes of transportation? Will future large scale parking facilities be constructed by the city (perhaps using parking in-lieu fees) for shared use, or will parking continue to be primarily constructed by private developers? Ideally, the planning goals for the parking system should match the current downtown Tempe master plan.
3. Consider updating the current parking zoning code to use the shared parking model developed by the Urban Land Institute. The model is more flexible than the existing

city model, provides for an estimated breakdown between employee and visitor parking needs, and provides for more seasonal adjustments. Also, consider using the methodology for planning for parking detailed in Section 3.3 of this report.

4. Continue to ensure sufficient downtown parking signage exists. The DTC has done a fantastic job in creating an easily identifiable downtown parking “brand”. Incorporate sufficient parking signage in any new downtown signage plans. Trailblazing signs should be located on incoming streets to direct visitors to available parking supplies. Parking lots should have identifying signage that includes user group restrictions, as well as lot identification (e.g., lot name, number). On-street parking signs should remind users they are intended for short-term visitors by denoting visitor parking and any time restrictions.
5. The concept of integrating transportation and parking elements as part of the larger strategic vision for the downtown supports the continued use of a “Park Once – Pedestrian First” planning concept. As previously stated, this concept encourages employees and visitors to park their vehicles in one location and then use another form of transportation to move around the downtown with excellent pedestrian, transit, parking and bicycle facilities. This concept will continue to be very important as the downtown develops.
6. Provide sufficient support for alternative modes of transportation. Continue to provide adequate bicycle racks, bus stops, comfortable pedestrian paths, bike paths, etc. in the downtown to encourage a transit/pedestrian first mentality. A marketing campaign could be created to encourage people (especially downtown employees) to walk, bike, carpool, vanpool or use mass transit to travel to the downtown area.

7. Work with developers, property owners and community stakeholders to improve both real and perceived safety levels in parking areas and on pedestrian pathways. Parking areas should provide a minimum of 2.0 to 5.0 footcandles per square foot.
8. Designate sufficient long-term parking in the downtown. Long-term parking should be provided in underutilized off-street parking lots and perimeter on-street parking spaces. Ideally, these spaces would be located more on the perimeter of the downtown core, with the parking located closer to core destinations reserved for short-term visitor parking. Any parking facilities developed on the perimeter of the downtown should provide some long-term parking.
9. With respect to new developments, attempt to better utilize existing parking supplies prior to designing and constructing new parking areas. The city should work with private parking lot owners to better utilize existing supplies, to the benefit of the city, developers and the private lot owners. The continued development of downtown will warrant the construction of additional parking supplies within an acceptable walking distance of the downtown core.

Mid-Term (Year Two):

1. Ensure the city has sufficient land use data for the downtown, and update annually or as necessary.
2. Conduct an update of the parking inventory and occupancy surveys contained in this report. These counts should be updated as necessary (when new developments occur) and updates should be conducted twice per year at a minimum.

3. Work with downtown businesses to determine loading and delivery needs. Where possible, designate specific loading zones, and determine adequate hours for delivery vehicle parking. Loading zones could be used for short-term visitor parking after designated loading zone hours.
4. Continue to develop and refine the parking marketing program to include up-to-date information for downtown visitors and businesses. Update downtown parking maps, detailing on-street and off-street parking supplies and system information, as needed. Update the parking information provided on the DTC website, and encourage other downtown businesses/organizations to include links to the DTC site on their websites. Ensure the lines of communication between the DTC, city and downtown businesses remain open concerning parking issues.

Long-Term (Years Three and Later):

1. Develop additional parking supplies when needed. The lots should be placed and sized appropriately, using the parking supply and demand analysis methodology detailed in this parking study report. Pedestrian paths to/from the parking should encourage use by providing level walking surfaces, shading, pedestrian amenities (e.g. benches, etc.) and traffic calming measures as needed.
2. As it is unlikely that the downtown parking system would be able to generate sufficient revenues to fully pay for public parking facilities (operations and bond debt), other funding options should be explored. This could include in-lieu fees or special assessments charged to developers, increasing parking rates/fees, etc.
3. The creation of structured parking should be viewed as the only sustainable option for providing parking for the future. Existing surface parking lots will be slowly lost

to downtown development in the future. Mixed-use and underground parking facilities (e.g., parking structures that incorporate first level retail space, adjacent residential units, commercial space above the structure) may be the preferred types of parking development downtown. It is also important to remember that the value of a parking garage could extend beyond the revenues it generates by providing an additional incentive for downtown development.

4. Ideally, the development of downtown parking facilities would coincide with the development(s) they serve. If a developer is interested in developing a portion of the downtown, and sufficient parking supplies cannot be provided using other methods, they could be required to provide the necessary parking or the DTC/city could propose providing the necessary parking along with the construction of the development. In-lieu fees could be used to provide the funds necessary for parking facility design and construction.